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*Date of Application, 3rd June, 1909*

*Complete Specification Left, 3rd Jan., 1910—Accepted, 2nd June, 1910*

**PROVISIONAL SPECIFICATION.**

**Improvements in or relating to Flexible Shafting.**

I, ROBERT THOMLINSON, Managing Director of the United Patents Company, Limited, of 6, Fairhurst Street, Liverpool, in the County of Lancaster, do hereby declare the nature of this invention to be as follows:—

This invention has mainly reference to flexible shafting, and has for its  
5 object to provide shafting of this type which shall be strong and durable; able to withstand deflection due to torque; and which may be manufactured from bar or wire in a heated condition, if desired.

According to my invention, there is provided a metallic core composed of comparatively short lengths or sections unconnected with each other, around which  
10 a single layer of bar or wire of suitable section is wound, preferably, closely together; and, in some cases, particularly where a shaft is required to rotate in both directions, in addition to said sectional core, comparatively short sleeves may be threaded over the bar or wire coil.

According to one and the preferred mode of manufacture of shafting, the short  
15 lengths or sections are tubular in form, and are threaded closely together upon a mandrel; the bar or wire at an elevated temperature is then wound upon said core in any known suitable way, being preferably also tempered; and the mandrel may be withdrawn. Adjacent ends of the core sections may be recessed to receive a ball or the like, also threaded upon the mandrel, in order to  
20 ensure that the whole of the coil shall be at all times supported.

A core as described may be employed, where applicable, for preventing the collapse of coils used for purposes other than the transmission of power.

Dated this 2nd day of June, 1909.

JOHN HINDLEY WALKER,  
139, Dale Street, Liverpool.  
Agent for the Applicant.

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**COMPLETE SPECIFICATION.**

**Improvements in or relating to Flexible Shafting.**

I, ROBERT THOMLINSON, Managing Director of the United Patents Company,  
30 Limited, of 6, Fairhurst Street, Liverpool, in the County of Lancaster, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention has reference to "flexible" shafting for transmitting rotary  
35 motion of the kind made up of a wire coil, and has for its object to provide means whereby shafting of this type shall be rendered strong and durable, able to withstand deflection due to torque, and be manufactured from bar or wire in a heated condition, if desired.

According to my invention, such shafting is provided with (preferably metal)  
40 core pieces or sleeves, or core pieces and sleeves, of comparatively short lengths unconnected with each other.

[Price 8d.]



*Thomlinson's Improvements in or relating to Flexible Shafting.*

The proximity of said core pieces or/and sleeves, with each other may depend upon the duty, and degree of flexibility required of the shaft, and this will, generally, be governed by the pitch of the coil; but in all cases said core pieces and sleeves will be so close to each other as to protect against deflection each individual coil.

According to one mode of applying the core pieces, the short lengths or sections are made tubular in form, and are threaded upon a mandrel; the bar or wire at an elevated temperature is then wound upon said core in any known suitable way, being, by preference also tempered; and the mandrel is withdrawn.

Alternatively, the pieces composing the core are driven into the "bore" of the shaft.

Adjacent ends of the core sections may be recessed to receive a ball or the like, in order to ensure that the whole of the coil shall be at all times reinforced.

The sleeves, which assist in maintaining the sectional concentricity, may be shrunk or driven on to the shafting.

In the annexed drawing, Figures 1 to 3 illustrate—by way of example only—a flexible shaft provided with both core pieces and sleeves; Figure 1 being an elevation, partly in section; Figure 2 an outside elevation; and Figure 3 an end view.

Figure 4 is a section of the bar—prior to being coiled—drawn to an enlarged scale, as compared with Figures 1 to 3.

Figure 5 illustrates the application of a ball between the core pieces.

Referring to the drawings, but, first, more particularly, to Figures 1 to 3, *a* represents the core pieces, and *b* the sleeves, these being bevelled at their ends, as shown, in order that the shaft *c* may bend with freedom.

In Figure 5, balls *e* are disposed between the core pieces *a*, the ends of said core pieces being suitably formed to receive them.

Where the core pieces are tubular, and it be desired to prevent elongation of the shaft, there is provided an internal twisted wire rope, or its equivalent, which, passing through the core pieces, is secured, in any convenient manner, at the ends of the shaft.

It is to be stated that it has heretofore been proposed to provide flexible coil shafting externally at intervals with sleeves or hoops to prevent the shaft from curving.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

1. In flexible shafting for the transmission of power, core pieces of comparatively short lengths unconnected with each other, said core pieces being so close to each other as to support each individual coil of the shaft against displacement.
2. In flexible shafting for the transmission of power, sleeves of comparatively short lengths unconnected with each other, said sleeves being so close to each other as to support each individual coil of the shaft against displacement.
3. In flexible shafting for the transmission of power, core pieces and sleeves of comparatively short lengths unconnected with each other, said core pieces and sleeves being so close to each other as to support each individual coil of the shaft against displacement.
4. In improvements relating to flexible shafting for the transmission of power, as claimed in Claim 1, the provision of metal balls, or the like, between the core pieces, for the purpose specified.

Dated this 1st day of January, 1910.

JOHN HINDLEY WALKER,  
139, Dale Street, Liverpool.  
Agent for the Applicant.

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.

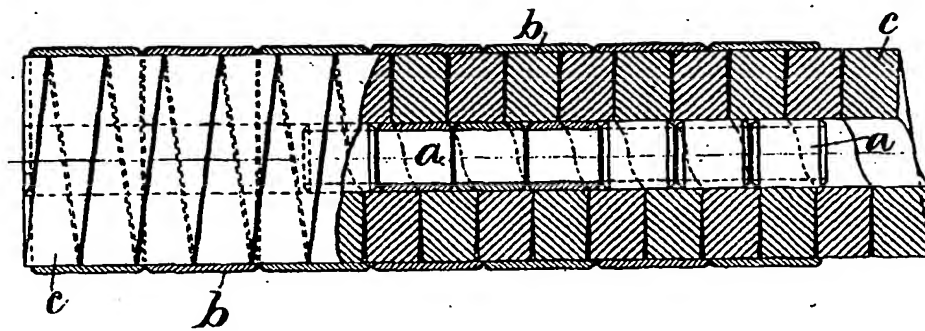


Fig. 2.

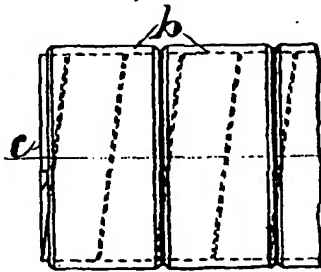


Fig. 3.

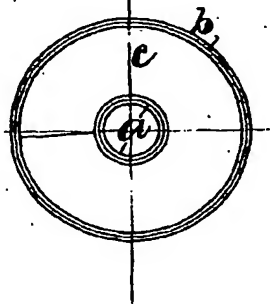


Fig. 4.

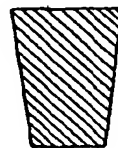
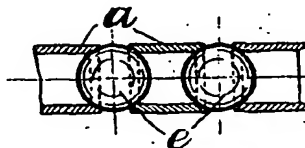


Fig. 5.



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